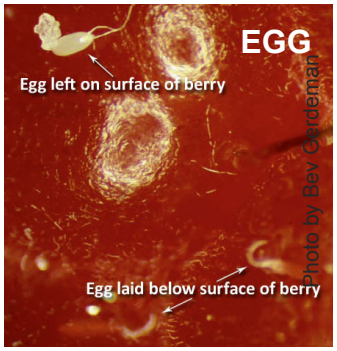
Spotted Wing Drosophila: A new pest in Ohio's fruit crops

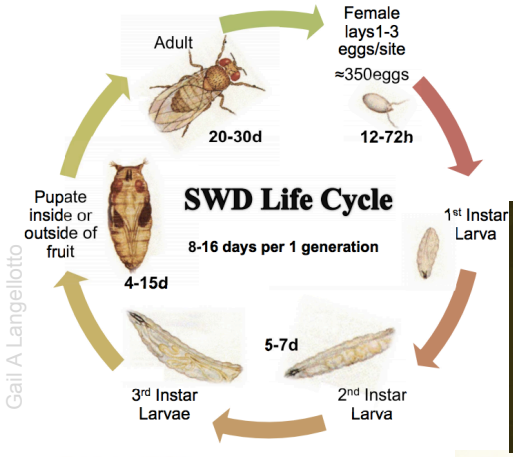
Celeste Welty, Extension Entomologist, Ohio State University, e-mail welty.1@osu.edu, phone 614-292-2803

Introduction
- Looks like common vinegar flies on overripe, fallen, decaying fruit
- But the new species attacks healthy ripening fruit

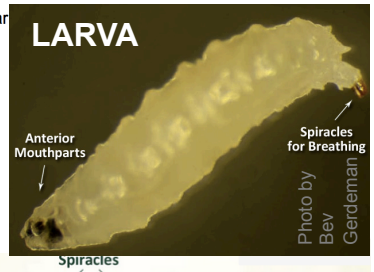
Detected locations
- In Hawaii since 1980
- California in 2008
- Florida, Washington, Oregon in 2009
- Michigan, Carolinas, Utah in 2010
- Many States in 2011 & 2012
- Ohio:
  - Raspberries, September 2011, VanWert County in Northwest Ohio
  - Aug.-Sept. 2012: Blackberries, raspberries, grapes, in VanWert, Licking, Pickaway, Ross, Franklin, Erie, Huron, Lorain, Ashland, Portage, Greene, Ashtabula Counties
  - July-September 2013: add Champaign, Clinton, Warren, Montgomery, Guernsey, Holmes, Wayne, Medina, Wood, Fulton, Fairfield, Meigs Counties
  - 2014: many more counties



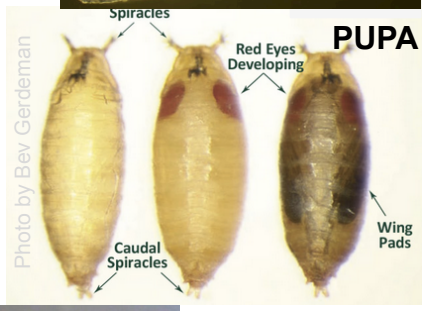
Hosts
- Early: cherries
- Mid: raspberries, blackberries, blueberries
- Late: grapes
- Also: peaches, plums, strawberries, cherry tomato



Damage
- Egg laying & larval feeding
- Starts as tiny scar on skin of fruit
- Skin collapses in 2-3 days; molds

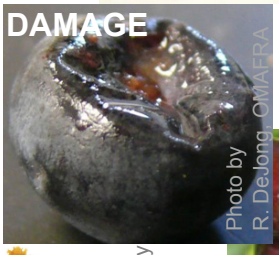


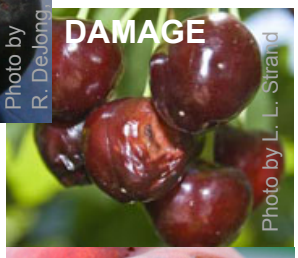
Life cycle
- Larvae feed inside fruit for 5-7 days
- Pupa inside or outside fruit
- 350 eggs per female fly
- One generation in 8-16 days
- Many generations per year
- Overwinters as adult in protected places

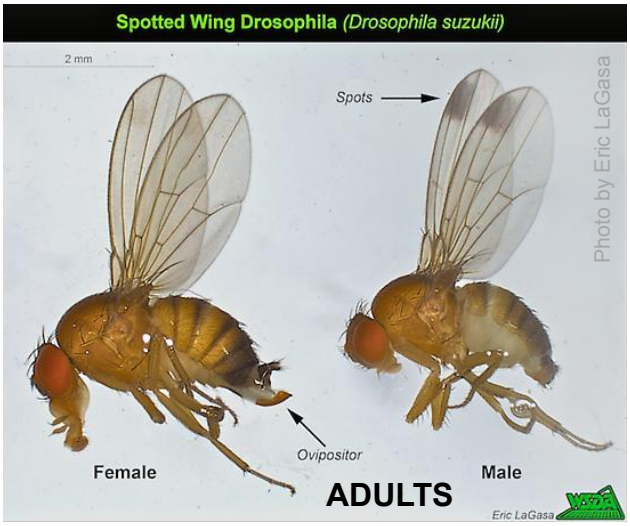


Identification
- Adult male:
  - Spots on wings (visible with naked eye)
  - Two dark bands on front leg (need magnifier)
- Adult female:
  - Saw-like, hard ovipositor (need magnifier)

Current Status
- Please alert us if this pest is found or suspected
  - Via your local extension educator
  - Or me (C. Welty) directly





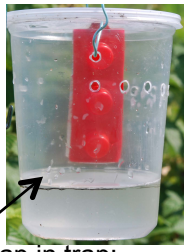


OVIPOSITOR

Figure 5. An enlarged view of the SWD ovipositor showing serrated edge (a); an example of a common vinegar fly ovipositor which does not have a sclerotized ovipositor (b).

Monitoring adult SWD flies with bait traps

- Make-your-own traps
  - – Clear plastic cup (1 quart) with lid
  - – Drill ¼" holes across top, along one side
  - – Optional, add red tape: adds attraction
- Commercial trap made by Contech: not recommended
- Bait option #1: New lure made by Trécé: recommended; hang lure from lid of trap, put 1 inch water with drop of soap in trap; change lure every 7 – 8 weeks
- Bait option #2: Apple cider vinegar (1 inch deep)
  - Add a drop of dish soap (to prevent floating)
  - Change bait weekly; do not dump in field
- Bait option #3: yeast + sugar + flour + water in small cup with net lid, float on vinegar
- Use strainer and fine brush to remove trapped insects
- Threshold: capture of a single confirmed SWD adult
- Beware, many non-target insects likely to be caught







Monitoring fruit for SWD larvae using salt tests

- In zip-top bag: 2 tablespoons salt + 2 cups warm water + fruit
- After 20 minutes, look for larvae floating to top

Management

- Do not delay harvesting; pick as soon as fruit first ripen
- Keep harvested fruit cooled as soon as picked
- Sanitation is critical: collect & destroy damaged fruit every 2 days; put culls in clear plastic bag in sun for 1 week
- Fine netting is a mechanical control option, especially for organic growers
- If any SWD found in trap, then fruit need protection by insecticide, starting when fruit begin to ripen (berries start to turn color), until final harvest
- Spray every 7 days with insecticides that provide 7 days residual activity
- Do a salt test weekly to see if control program working well
- Insecticides for home gardens: see separate document; spinosad is one good choice for most crops.
- For resistance management, rotate among different mode-of-action groups: spinosyns (yellow in chart), diamides (light gray), pyrethroids (pink), organophosphates (blue), carbamates (green), and neonicotinoids (dark gray)
- Insecticide options (based primarily on trials in OR, WA, CA, MI, NJ, NC, FL in 2011 and 2012) in table below

Efficacy	Mode of action group	Product	Residual activity (days)	Pre-harvest interval (PHI)						
				raspberry, blackberry	blue-berry	straw-berry	grape	cherry	peach	plum
Very effective	5	§ Delegate	5-7	1 day	3 days	X	7 days	7 days	14 days	7 days
	5	§ Radiant	5-7	X	X	1 day	X	X	X	X
	28	Exirel	5	X	3 days	X	X	3 days	3 days	3 days
	3A	! Mustang Max	7-10	1 day	1 day	X	1 day	14 days	14 days	14 days
	3A	! Brigade	7-10	3 days	1 day	0 days	30 days	X	X	X
	3A	! Hero	7-10	3 days	1 day	X	30 days	X	X	X
	3A	! Danitol	7-10	3 days	3 days	2 days	21 days	3 days	3 days	3 days
	3A	! Asana	7-10	7 days	14 days	X	X	14 days	14 days	14 days
	3A	! Baythroid	7-10	X	X	X	3 days	7 days	7 days	7 days
	3A	! Warrior	7-10	X	X	X	X	14 days	14 days	14 days
	3A	! Pounce	7-10	X	X	X	X	3 days	14 days	X
	1B	Imidan	7	X	3 days	X	14 days	7 days	14 days	7 days
	1B	!§ Diazinon	7	7 days	7 days	5 days	X	21 days	21 days	21 days
	1A	! Lannate	3-6	X	3 days	X	X	X	4 days	X
Effective	1B	Malathion	5-7	1 day	1 day	3 days	3 days	3 days	7 days	X
	5	Entrust [OMRI]	3-5	1 day	3 days	1 day	7 days	14 days	14 days	7 days
Moderately effective	1A	Sevin	10	7 days	7 days	7 days	7 days	3 days	3 days	3 days
	4A	§ Assail	1-3	1 day	1 day	1 day	3 days	7 days	7 days	7 days
Slightly eff.	3A	Pyganic [OMRI]	1-3	0 days	0 days	0 days	0 days	0 days	0 days	0 days
Not effective	4A	Actara	1-3	3 days	3 days	X	5 days	14 days	14 days	14 days
	4A	Admire Pro	1-3	3 days	3 days	7 days	0 days	7 days	0 days	7 days

! Restricted-Use Pesticide
§ Not allowed in greenhouses or high tunnels
X means that the product is NOT ALLOWED for use on that crop.

Compiled 26 March 2012, revised 23 April 2013, 5 November 2013, 11 February 2015, 22 June 2015.